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Chief, Environmental Enforcement Section
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U.S. Department of Justice
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Reference Case NO. 90-5-2-1-11603

Shell Chemical LP
Norco Plant
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August 24, 2022

SUBJECT: UNITED STATES V. SHELL CHEMICAL LP
CIVIL ACTION NUMBER 2:18-cv-1404-EEF-JVM
SECOND HALF 2021 SEMI-ANNUAL REPORT
LDEQ AI NO. 26336

Dear Sir or Madam:

Enclosed is the semi-annual report for the first half of 2022 for Shell Chemical LP's Petrochemical Plant in Norco, Louisiana (Shell Norco). This report is being submitted pursuant to the requirements in Section IX of Civil Action Number 2:18-cv-1404-EEF-JVM which became effective on February 6, 2019. This report covers the period from January 1, 2022 through June 30, 2022.

NO EPA ACTION IS REQUIRED WITH RESPECT TO THIS SUBMISSION: It is being submitted to fulfill a requirement under the Consent Decree for information purposes only. Any issues encountered or anticipated with respect to meeting the Compliance Programs of this Consent Decree are addressed in Section IX of this report.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If you have any questions, please contact Jacob Foy at (504) 465-6955 or Jacob.Foy@shell.com.

Sincerely,

Jack Holden
Production Manager
Attorney-in-Fact – Shell Chemical LP

JSF/mlc
Enclosures

cc: W/Attachments

EES Case Management Unit
Environment and Natural Resources Division
U.S. Department of Justice
P.O. Box 7611
Washington, D.C. 20044-7611
Re: DJ #90-5-2-1-11603

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Renee Toups (Regulatory Advisor)

Chemical File: 706-15 Semi-Annual Reports

Electronic Filename:
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CD/ORDERS/SETTLEMENTS > Chem Flare Consent Decree > CD COMPLIANCE > Reports > SemiAnnual > 2022 1H

Shell Chemical LP
Norco Chemical Plant
Consent Decree
Semi-Annual Report
1st Half 2022
1/1/2022 – 6/30/2022

Report Index:

Consent Decree Semi-Annual Report
Section V. Fenceline Monitoring Program
Paragraph 19

Fenceline Air Monitoring Reports

In accordance with Paragraph 19 of the Consent Decree, the following information is provided as part of this Semi-Annual Report:

a. **In spreadsheet format, the individual sample results for each monitor comprising the Fenceline Monitoring System, every two-week rolling annual average benzene concentration difference value (once annual averages are available), and the corresponding meteorological data for the relevant monitoring periods. The first two columns of each spreadsheet will list, respectively, the date and time for each sample taken; and**

   The individual sample results for each monitor and the corresponding meteorological data are provided in Attachment 1a in spreadsheet format.

b. **A detailed description of the actions and findings of any root cause analysis and corrective action(s) undertaken pursuant to Paragraph 3(g) of Appendix 1.8, including the known results of the corrective action(s) and the anticipated emissions reductions (in TPY per pollutant).**

   A detailed description of the root cause analyses and corrective actions for 1H 2022 can be found in Attachment 1b.

Consent Decree Semi-Annual Report
Section VI.C Waste Gas Minimization
Paragraph 39

Subsequent Updates to WGMPs

In accordance with Appendix 1.1 of the Consent Decree, Shell Norco submitted the Initial Waste Gas Minimization Plans (WGMP) for the four covered flares on July 30, 2020. A first updated WGMP was submitted on December 20, 2021, as required in Paragraph 38.

Pursuant to Paragraph 39, any subsequent updates to WGMPs will be submitted as part of the Semi-Annual Report after submission of the first updated WGMP.

Consent Decree Semi-Annual Report
Section VI.D Flare Gas Recovery
Paragraph 48

FGRS Shutdown

A FGRS Shutdown is due to operating conditions (such as high temperatures, large quantities of entrained liquid in Vent Gas, or contaminants in the Vent Gas that are unsuitable for recovery) outside the design operating range of the FGRS, including the associated knock-out drum so long as the outage is necessary for safety or to preserve the mechanical integrity of the FGRS.

In accordance with Paragraph 48 of the Consent Decree, each outage that occurred under Shutdown conditions are identified below, including the date, duration, cause(s), corrective action taken, and status of implementation of the corrective action.

FGRS Shutdown on 3/23/2022:

Shutdown dates and duration:
3/23/22 15:15 – 3/24/22 9:30 9:15 (18.25 hours).

Root Cause(s):

The OL-5 Flare Gas Recovery System (FGRS) was shutdown to mitigate safety risks and preserve mechanical integrity of the FGRS and associated equipment during an OL-5 unit upset on 3/23/2022. The suction block valve from the 2nd stage Process Gas Compressor (PGC) suction drum to gasoline pump P-5021 was opened at approximately 2:45pm on 3/23/22. When the suction line valve from the 2nd stage was inadvertently lined up, all of the liquid from the 2nd stage drum flowed to the 1st stage drum through this common suction line due to the higher pressure in the 2nd stage drum. Additionally, once the existing liquid level in the 2nd stage drum had been depleted, both newly condensed liquid and vapor flowed through this suction line to the 1st stage drum thus causing P-5021 and the P-5019 to lose suction. With these gasoline pumps not pumping, only the P-5018 process condensate pumps were available to pump all 1st stage process condensate and gasoline plus all 2nd stage process condensate and gasoline from the 1st stage drum. Operations managed the event by dropping out liquid from the 1st stage drum to the Warm Flare Drum and double pumping process condensate and some gasoline to the Sour Water Bypass system. Even with these mitigations, the PGC came within 0.5% of the high level PGC 1st stage suction drum trip point. Once the 2nd stage suction line to P-5021 was fully closed, the 1st stage and 2nd stage level operation returned to normal within a few hours. Once the PGC operation returned to normal and stable operation, Operations worked to put the FGR compressor back in service. Note, the aforementioned operational maneuvers successfully avoided a Reportable Flaring Incident (RFI) during this period while safeguarding the mechanical integrity of the OL-5 FGRS.

The OL-5 unit upset led to the shutdown of the FGRS. The unit and PGC were stabilized and the 2nd stage suction line to P-5021 was fully closed, at which point the FGRS was returned to service.

Corrective Action(s):

- Completed: The PGC 2nd stage suction line to P-5021 was fully closed and the unit was stabilized.

Consent Decree Semi-Annual Report
Section VI.E Flare Combustion Efficiency
Paragraph 51.c

Visible Emissions

Per Paragraph 51.b, each Covered Flare must operate with no Visible Emissions, except for periods not to exceed a total of five (5) minutes during any two (2) consecutive hours when the Covered Flare is In Operation and the Vent Gas flow rate is less than the smokeless design capacity of the Covered Flare.

Per Paragraph 51.c, the Semi-Annual report must include any instance where Visible Emissions were observed for more than five (5) minutes during any two (2) consecutive hours. The record must include the date and time of the 2-hour period and an estimate of the cumulative number of minutes in the 2-hour period for which emissions were visible.

Covered Flare (Documented Smokeless Capacity)	Date	Time of 2-hour Period	Estimate of Cumulative Number of Minutes in 2-Hour Period
OL-5 Ground Flare (100 Mlb/hr)	None	NA	NA
OL-5 Elevated Flare (400 Mlb/hr)	None	NA	NA
GO-1 Elevated Flare (130 Mlb/hr)	5/3/2022	16:30-18:30	38
	5/3/2022	18:31-20:30	47
	5/3/2022	20:31-22:30	55
West Ops Elevated Flare (100 Mlb/hr)	None	NA	NA

Consent Decree Semi-Annual Report
Section IX. Reporting Requirements
Paragraph 72

A. Description of status of work performed and progress made toward implementing all requirements in Section VI (Compliance Requirements) at the Facility

Section VI (Compliance Requirements) includes the Instrumentation and Operation of Monitoring Systems (Paragraphs 22-24, 26-30) of which Shell Norco is required to meet compliance according to the schedule in Appendix 1.1 of the Consent Decree.

OL-5 Ground Flare
Shell Norco installed and operated all required instrumentation, controls, and monitoring systems set forth in Paragraphs 23-27 at the OL-5 Ground Flare by the Effective date as required by Appendix 1.1 of the Consent Decree. In addition, these instruments and monitoring systems meet the Specifications, Calibration, Quality Control, and Maintenance requirements in Paragraph 28 and 30. Shell Norco maintains a Monitoring Plan on site for the OL-5 Ground Flare instruments and monitoring systems per Paragraph 29.

GO-1 Elevated Flare
Shell Norco installed and operated all required instrumentation, controls, and monitoring systems set forth in Paragraphs 23-27 at the GO-1 Elevated Flare by December 31, 2019 as required by Appendix 1.1 of the Consent Decree. In addition, these instruments and monitoring systems meet the Specifications, Calibration, Quality Control, and Maintenance requirements in Paragraph 28 and 30. Shell Norco maintains a Monitoring Plan on site for the GO-1 Elevated Flare instruments and monitoring systems per Paragraph 29.

West Ops Elevated Flare
Shell Norco installed and operated all required instrumentation, controls, and monitoring systems set forth in Paragraphs 23-27 at the West Ops Elevated Flare by December 31, 2020 as required by Appendix 1.1 of the Consent Decree. In addition, these instruments and monitoring systems meet the Specifications, Calibration, Quality Control, and Maintenance requirements in Paragraph 28 and 30. Shell Norco maintains a Monitoring Plan on site for the West Ops Elevated Flare instruments and monitoring systems per Paragraph 29.

OL-5 Elevated Flare
Shell Norco installed and operated all required instrumentation, controls, and monitoring systems set forth in Paragraphs 23-27 at the OL-5 Elevated Flare by April 27, 2021. In addition, these instruments and monitoring systems meet the Specifications, Calibration, Quality Control, and Maintenance requirements in Paragraph 28 and 30. Shell Norco maintains a Monitoring Plan on site for the OL-5 Elevated Flare instruments and monitoring systems per Paragraph 29.

B. Description of any problems encountered or anticipated in meeting the requirements in Section VI (Compliance Requirements) at the Facility, together with implemented or proposed solutions

No issues were encountered in the first half of 2022 with respect to meeting the requirements in Section VI.

Hurricane Ida Force Majeure

On September 9, 2021, Shell Norco submitted a Notification of Delay pursuant to Paragraph 95 of the Consent Decree to USEPA regarding the Hurricane Ida Force Majeure event and potential delays to reestablishing compliance obligations. Shell Norco provided supplemental notifications per Paragraph 95 to EPA on January 19, 2022, March 10, 2022, and April 27, 2022. The cover letter for the April 27, 2022, submittal is provided in Attachment 5.

The Hurricane Ida Force Majeure is relevant to this semi-annual report because the GO-1 Elevated flare steam flow meters experienced downtime that extended into February of 2022.

C. Description of status of any permit applications, including a summary of all permitting activity, pertaining to compliance with Consent Decree

The application for the Olefins Title V Renewal Permit (LDEQ Permit No. 2520-V8) was submitted on January 21, 2020 to LDEQ, EPA, and others as required in Section XVI of the CD (Notices). The application included the incorporation of Consent Decree requirements as required by Paragraph 64. Subsequently, a new Olefins Title V Permit (LDEQ Permit No. 2520-V9) was issued on November 17, 2020 and includes all requirements listed in Paragraph 65. The current Olefins Title V Permit is 2520-V10, issued on March 25, 2021.

The incorporation into the federally enforceable Olefins Title V Permit satisfies the requirements in Section VII and Paragraph 64 such that the requirements (i) have become and remain "applicable requirements" as that term is defined in 40 CFR 70.2; (ii) were incorporated into a federally enforceable Title V permit, and (iii) will survive termination of this Consent Decree.

D. Copy of any report that was submitted only to LDEQ and that pertains to compliance with this Consent Decree

No reports were only submitted to LDEQ that pertains to compliance with the Consent Decree.

E. Description of progress in satisfying its obligations in connection with the Fenceline Monitoring Program under Section V, including, at a minimum, a narrative description of activities undertaken; status of any construction or compliance measures; including the completion of any milestones set forth in the Fenceline Monitoring Plan attached as Appendix 1.8, and a summary of costs incurred since the previous report.

A report for timing and public transparency was submitted to EPA on October 31, 2019. A revised map was submitted to EPA on February 5, 2020, and the Fenceline Monitoring System commenced collecting data by February 6, 2020. The passive monitor locations have been sited according to the requirements in Appendix 1.8. All necessary physical construction has been completed.

F. Any updated WGMP for the Facility as required by Paragraph 39

Subsequent Updates to WGMPs

In accordance with Paragraph 39, after submission of the First Updated WGMP and on an annual basis thereafter until termination, an updated WGMP will be provided as part of the Semi-Annual Report if the site (a) installs a new Flare or permanently removes a Covered Flare from service, (b) connects a new Waste Gas stream to a Covered Flare, (c) modifies the Baseload Waste Gas Flow Rate to a Covered Flare, (d) installs an additional FGRS or materially alters the FGRS, or (e) changes the design of a Covered Flare.

Each update must describe, if and as necessary, changes in the information required in Subparagraphs 37.a-37.e, and 38.a-38.b.

Shell Norco submitted the Initial Waste Gas Minimization Plans (WGMP) for the four covered flares on July 30, 2020 per the requirement in Appendix 1.1 of the Consent Decree. A first updated WGMP was submitted on December 21, 2021, fulfilling the requirement in Paragraph 38 to submit an updated WGMP no later than eighteen months after July 30, 2020 (January 2022).

G. A summary of any internal flaring incident reports as required by Paragraph 42

Per Paragraph 42.a, Shell Norco is required to conduct an investigation into the root cause(s) of a Reportable Flaring Incident and prepare and keep as a record an internal report no later than forty-five (45) days following the end of a Reportable Flaring Incident.

Per Paragraph 42.b, a summary must be provided in the Semi-Annual Report for each Reportable Flaring Incident which occurred in the semi-annual period and must include:

- **i. Date;**
- **ii. Duration;**
- **iii. Amount of VOCs and HAPs emitted;**
- **iv. Root cause(s);**
- **v. Corrective action(s) completed;**
- **vi. Corrective action(s) still outstanding; and**
- **vii. An analysis of any trends identified by Defendant in the number of Reportable Flaring Incidents, the root causes, or the type(s) of corrective action(s).**

OL-5 Elevated/Ground Flare Reportable Flaring Incidents

The OL-5 Ground Flare and OL-5 Elevated Flare are equipped with accurate flow meters as required by the Consent Decree as of each respective Effective Date. Shell Norco has provided a detailed summary of the Reportable Flaring Incidents as required in this Semi-Annual Report in Attachment 2.

Shell Norco has not identified any significant trends in the Reportable Flaring Incidents. The site will continue to analyze the incidents to identify trends as required.

GO-1 Elevated Flare Reportable Flaring Incidents

The GO-1 Elevated Flare is equipped with an accurate flow meter as required by the Consent Decree as of June 30, 2020. Shell Norco has provided a detailed summary of the Reportable Flaring Incidents as required in this Semi-Annual Report in Attachment 3.

Shell Norco has not identified any significant trends in the Reportable Flaring Incidents. The site will continue to analyze the incidents to identify trends as required.

West Ops Elevated Flare Reportable Flaring Incidents

The West Ops Elevated Flare is equipped with an accurate flow meter as required by the Consent Decree as of June 30, 2021. Shell Norco has provided a detailed summary of the Reportable Flaring Incidents as required in this Semi-Annual Report in Attachment 4. No Reportable Flaring Incidents occurred at the West Ops Elevated Flare in the 1st half of 2022.

Shell Norco has not identified any significant trends in the Reportable Flaring Incidents. The site will continue to analyze the incidents to identify trends as required.

H. A summary of the following, per Covered Flare per Calendar Quarter

i. Instrument Downtime of Each Monitoring Instrument/Equipment for Paragraphs 23, 26, and 27 expressed as both an absolute number and a percentage of time that the Covered Flare is In Operation and Capable of Receiving Sweep, Supplemental, and/or Waste Gas.

Instrument Downtime of Each Monitoring Instrument/Equipment for Paragraphs 23, 26, & 27				
Covered Flare	**Equipment**	**Quarter (2022)**	**Absolute Number of Hours (hrs)**	**Total Percentage of Time (%)**
OL-5 Ground Flare	H2 Analyzer AI-1070	Jan-Mar	0	0.0%
		Apr-June	0	0.0%
	BTU AI-1073	Jan-Mar	2.5	0.11%
		Apr-June	12.5	0.57%
	Vent Gas Flow FT-1069	Jan-Mar	0	0.0%
		Apr-June	23.7	1.09%
	Steam Flow FT-1094	Jan-Mar	0	0.0%
		Apr-June	0	0.0%
	Steam Flow FT-1071	Jan-Mar	0	0.0%
		Apr-June	32.2	1.48%
	Steam Flow FT-1072	Jan-Mar	0	0.0%
		Apr-June	0.7	0.03%
	In Operation and Capable of Receiving Waste Gas	1st Half	3961.3	91.2%

Instrument Downtime of Each Monitoring Instrument/Equipment for Paragraphs 23, 26, & 27				
Covered Flare	**Equipment**	**Quarter (2022)**	**Absolute Number of Hours (hrs)**	**Total Percentage of Time (%)**
OL-5	H2 Analyzer AI-1124	Jan-Mar	0.1	0.0%

Instrument Downtime of Each Monitoring Instrument/Equipment for Paragraphs 23, 26, & 27				
Covered Flare	**Equipment**	**Quarter (2022)**	**Absolute Number of Hours (hrs)**	**Total Percentage of Time (%)**
Elevated Flare		Apr-June	0	0.0%
	BTU AI-1125	Jan-Mar	2.2	0.1%
		Apr-June	0	0.0%
	Vent Gas Flow FT-1126	Jan-Mar	0	0.0%
		Apr-June	17.5	0.8%
	Steam Flow FT-9351	Jan-Mar	0	0.0%
		Apr-June	0	0.0%
	Steam Flow FT-9352	Jan-Mar	0	0.0%
		Apr-June	0	0.0%
	Steam Flow FT-9353	Jan-Mar	0	0.0%
		Apr-June	0	0.0%
	In Operation and Capable of Receiving Waste Gas	1st Half	649.9	15.0%

Instrument Downtime of Each Monitoring Instrument/Equipment for Paragraphs 23, 26, & 27				
Covered Flare	**Equipment**	**Quarter (2022)**	**Absolute Number of Hours (hrs)**	**Total Percentage of Time (%)**
GO-1 Elevated Flare	H2 Analyzer AI-2141	Jan-Mar	0.2	0.0%
		Apr-June	0	0.0%
	BTU AI-2142	Jan-Mar	0	0.0%
		Apr-June	0	0.0%
	Vent Gas Flow FT-2143	Jan-Mar	0	0.0%
		Apr-June	0	0.0%
	Steam Flow FT-2146	Jan-Mar	0	0.0%
		Apr-June	792	36.7%
	Steam Flow FT-8804	Jan-Mar	0	0.0%
		Apr-June	792	36.7%
	Natural Gas FT-2145	Jan-Mar	0	0.0%
		Apr-June	0	0.0%
	Nitrogen FT-8810	Jan-Mar	0	0.0%
		Apr-June	0	0.0%
	In Operation and Capable of Receiving Waste Gas	1st Half	285.4	6.6%

Instrument Downtime of Each Monitoring Instrument/Equipment for Paragraphs 23, 26, & 27				
Covered Flare	**Equipment**	**Quarter (2021)**	**Absolute Number of Hours (hrs)**	**Total Percentage of Time (%)**
West Ops Elevated	H2 Analyzer AI-2147	Jan-Mar	0	0.0%
		Apr-June	0	0.0%

Instrument Downtime of Each Monitoring Instrument/Equipment for Paragraphs 23, 26, & 27				
Covered Flare	**Equipment**	**Quarter (2021)**	**Absolute Number of Hours (hrs)**	**Total Percentage of Time (%)**
Flare	BTU AI-2148	Jan-Mar	0	0.0%
		Apr-June	0	0.0%
	Vent Gas Flow FT-2149	Jan-Mar	0	0.0%
		Apr-June	0	0.0%
	Steam Flow FT-2325A	Jan-Mar	0	0.0%
		Apr-June	0	0.0%
	Steam Flow FT-2325B	Jan-Mar	0	0.0%
		Apr-June	0	0.0%
	Steam Flow FT-2325C	Jan-Mar	0	0.0%
		Apr-June	0	0.0%
	In Operation and Capable of Receiving Waste Gas	1st Half	64.2	1.5%

ii. If the total number of hours of Instrument Downtime on any monitoring instrument/equipment required pursuant to Paragraphs 23 or 26 that exceeds 5% of the time in a Calendar Quarter that the Covered Flare affected by the Instrument Downtime is In Operation, an identification of the periods of downtime by date, time, cause (including Malfunction or maintenance), and if the cause is asserted to be a Malfunction, the corrective action taken.

The GO-1 Elevated Flare steam flow meters exceeded 5% of the time in a Calendar Quarter for Instrument Downtime due to the impacts of Hurricane Ida. As previously reported in the second half of 2021 Semi-Annual Report and the Hurricane Ida Force Majeure notification submitted to EPA on April 27, 2022, the downtime was directly related to the Force Majeure event.

GO-1 Elevated Flare Instrument Downtime			
Instrument/equipment	**Downtime periods**	**Cause**	**Corrective Action(s)**
Steam Flow FT-2146 & Steam Flow FT-8804	1/1/2022 at 0:00 – 2/3/2022 at 0:00	Malfunction: The steam flow meters were damaged significantly during and after Hurricane Ida, rendering them unreliable until they could be replaced and calibrated. Supply chain and vendor delays also contributed to the extended downtime.	The steam flow meters were replaced and calibrated by a certified third-party vendor.

iii. The total number of hours expressed as both an absolute number of hours and a total percentage of time that the Covered Flare was In Operation in which the requirements of Paragraphs 58-59 were not applicable because the only gas or gases being vented were pilot gas or purge gas.

Time that Covered Flare was In Operation in which Paragraphs 58-59 were not applicable:		
Covered Flare	**Absolute Number of Hours (hrs)**	**Total Percentage of Time (%)**
OL-5 Ground Flare	382.7	8.81%
OL-5 Elevated Flare	3670.1	85.0%
GO-1 Elevated Flare	4034.6	93.4%
West Ops Elevated Flare	4255.8	98.5%

iv. The total number of hours expressed as both an absolute number of hours and a percentage of time the Covered Flare was In Operation, of exceedances of the emissions standards in Paragraphs 58-59; provided, however, that if the exceedances of these standards was less than 5% of the time in a Calendar Quarter and was due to one or more of the exceptions set forth in Paragraph 60, the report must so note.

Exceedances of the Emissions Standards in Paragraphs 58-59					
Covered Flare	**Standard & Reference**	**Quarter (2020)**	**Absolute Number of Hours (hrs)**	**Total Percentage of Time (%)**	**Notes on Exceedances**
OL-5 Ground Flare	NHVvg > 300 Btu/scf (P 58.a)	Jan-Mar	0.0	0.0%	-
		Apr-June	0.0	0.0%	-
	NHVcz > 470 (P 58.c)	Jan-Mar	0.0	0.0%	-
		Apr-June	0.0	0.0%	-

Exceedances of the Emissions Standards in Paragraphs 58-59					
Covered Flare	**Standard & Reference**	**Quarter (2020)**	**Absolute Number of Hours (hrs)**	**Total Percentage of Time (%)**	**Notes on Exceedances**
OL-5 Elevated Flare	NHVvg > 300 Btu/scf (P 58.a)	Jan-Mar	0.0	0.0%	-
		Apr-June	0.0	0.0%	-
	NHVcz > 270 (P 58.b)	Jan-Mar	0.5	0.02%	The BD-5 unit was starting up on 1/11/22 following an unplanned outage. Further details are provided in Section IX.H.v.
		Apr-June	8.25	0.4%	The NHVcz deviations occurred on 5/9/22 and 5/10/22 after a BD-5 unit decontamination activity. Further details are provided in Section IX.H.v.

Exceedances of the Emissions Standards in Paragraphs 58-59					
Covered Flare	**Standard & Reference**	**Quarter (2020)**	**Absolute Number of Hours (hrs)**	**Total Percentage of Time (%)**	**Notes on Exceedances**
GO-1 Elevated Flare	NHVvg > 300 Btu/scf (P 58.a)	Jan-Mar	0.0	0.0%	-
		Apr-June	0.0	0.0%	-
	NHVcz > 270 (P 58.b)	Jan-Mar	5.0	0.2%	The GO-1 Dry Gas Compressor (DGC) tripped on 2/25/22 due to high radial vibrations. Further details are provided in Section IX.H.v.
		Apr-June	0.0	0.0%	-

Exceedances of the Emissions Standards in Paragraphs 58-59					
Covered Flare	**Standard & Reference**	**Quarter (2020)**	**Absolute Number of Hours (hrs)**	**Total Percentage of Time (%)**	**Notes on Exceedances**
West Ops Elevated Flare	NHVvg > 300 Btu/scf (P 58.a)	Jan-Mar	0.0	0.0%	-
		Apr-June	0.0	0.0%	-
	NHVcz > 270 (P 58.b)	Jan-Mar	0.0	0.0%	-
		Apr-June	0.0	0.0%	-

v. **If the exceedance of the emissions standards in Paragraphs 58-59 was not due to one of the exceptions in Paragraph 60 (Standard During Instrument Downtime), or if the exceedance was due to one or more of the exceptions in Paragraph 60 and the total number of hours caused by the exceptions exceeds 5% of the time in a Calendar Quarter that the Covered Flare affected by the Instrument Downtime was In Operation, an identification of each block period that exceeded the standard, by time and date; the cause of the exceedance (including Startup, Shutdown, maintenance, or Malfunction), and if the cause is asserted to be a Malfunction, an explanation of any corrective actions taken.**

The OL-5 Elevated Flare experienced deviations of the Net Heating Value of Combustion Zone Gas (NHV_{cz}) limit on 1/1/22, 5/9/22 and 5/10/22 as determined on a Fifteen-Minute Block Average under Paragraph 55.c.

Date	**# of 15-Minute Blocks**	**Cause & Corrective Action(s)**
1/11/2022	2	The BD-5 unit was starting up on 1/11/22 following an unplanned outage due to a steam load shed event. During startup a rush of flare flow caused Ops to increase steam to prevent smoking. Within minutes, the flare flow decreased rapidly leaving a high amount of steam in the mixture leading to low NHVcz. Programming updates for the OL-5 NHV control scheme were completed in Q2 2022, and refresher training was provided to OL-5 Operations.

5/9/2022 – 5/10/2022	33	The NHV deviations began to occur on 5/9/22 and 5/10/22 when a portion of flow was redirected from the OL-5 Elevated Flare to the OL-5 Ground Flare after BD-5 unit decontamination activity. When flow was redirected to the Ground Flare, nitrogen purge remained at a reduced flow therefore causing high flare tip skin temperatures at the Elevated Flare. To mitigate the high flare skin temperatures, Operations increased steam which led to decreased NHVcz values. Supplemental gas programming and controls and Data Control System graphic alarm displays will be updated in Q3 2022. Refresher training was provided to OL-5 Operations

The GO-1 Elevated Flare experienced deviations of the Net Heating Value of Combustion Zone Gas (NHV_{cz}) limit on 2/25/2022 as determined on a Fifteen-Minute Block Average under Paragraph 55.c.

Date	# of 15-Minute Blocks	Cause & Corrective Action(s)
2/25/2022	20	The GO-1 Dry Gas Compressor (DGC) tripped on 2/25/22 due to high radial vibrations. During the flaring event, low NHVcz deviations occurred at the GO-1 Elevated Flare due to high steam flows set in manual control relative to low flare flows. The supplemental gas controls were also inadvertently set to a low BTU value, which hindered the addition of supplemental natural gas. The NHVcz control scheme was updated in March 2022 to improve compliance with the 270 BTU/scf requirement. The supplemental natural gas control setpoint was increased to ensure compliance during low flare flow scenarios.

vi.

vi. Sufficient information to document compliance with the FGRS Compressor availability requirements of Paragraph 46. For any period of non-compliance, Defendant must identify the date, cause, and corrective action taken.

There were no periods of FGRS Availability less than 98% in the first half of 2022.

vii. Any additional matters believed should be brought to the attention of EPA or LDEQ.

None.

Consent Decree Semi-Annual Report
Section IX. Reporting Requirements
Paragraph 73

Annual Emissions Data

Annual Emissions Data for Calendar Year 2021 is provided in the table below.

Paragraph 73: Annual Emissions Data – 2021*							
Covered Flare	**VOC (tpy)**	**NOx (tpy)**	**CO (tpy)**	**HAP (tpy)**	**CO2 (tpy)**	**Methane (tpy)**	**Ethane (tpy)**
OL-5 Ground Flare	49.92	20.19	82.00	7.68	31,319.05	94.53	0.00
OL-5 Elevated Flare	119.65	33.75	142.93	16.76	84,780.06	255.90	0.00
GO-1 Elevated Flare	175.86	24.85	203.68	13.53	109,731.66	331.22	0.00
West Ops Elevated Flare	0.70	2.26	10.74	0.02	6,219.49	18.77	0.00

*Annual emissions data for reporting year 2021 include routine, upset, shutdown/startup/maintenance, and LDEQ-approved Variance emissions related to Hurricane Ida recovery.

Consent Decree Semi-Annual Report
Section IX. Reporting Requirements
Paragraph 74

Review of Non-Compliances

Instrument Downtime

GO-1 Elevated Flare Instrument Downtime			
Instrument/equipment	**Downtime periods**	**Cause**	**Corrective Action(s)**
Steam Flow FT-2146 & Steam Flow FT-8804	1/1/2022 at 0:00 – 2/3/2022 at 0:00	Malfunction: The steam flow meters were damaged significantly during and after Hurricane Ida, rendering them unreliable until they could be replaced and calibrated. Supply chain and vendor delays also contributed to the extended downtime.	The steam flow meters were replaced and calibrated by a certified third-party vendor.

The OL-5 Elevated Flare experienced deviations of the Net Heating Value of Combustion Zone Gas (NHV_{cz}) limit on 1/1/22, 5/9/22 and 5/10/22 as determined on a Fifteen-Minute Block Average under Paragraph 55.c.

Date	# of 15-Minute Blocks	Cause & Corrective Action(s)
1/11/2022	2	The BD-5 unit was starting up on 1/11/22 following an unplanned outage due to a steam load shed event. During startup a rush of flare flow caused Ops to increase steam to prevent smoking. Within minutes, the flare flow decreased rapidly leaving a high amount of steam in the mixture leading to low NHVcz. Programming updates for the OL-5 BTU control scheme were completed in Q2 2022, and refresher training was provided to OL-5 Operations.
5/9/2022 – 5/10/2022	33	The NHV deviations began to occur on 5/9/22 and 5/10/22 when a portion of flow was redirected from the OL-5 Elevated Flare to the OL-5 Ground Flare after BD-5 unit decontamination activity. When flow was redirected to the Ground Flare, nitrogen purge remained at a reduced flow therefore causing high flare tip skin temperatures at the Elevated Flare. To mitigate the high flare skin temperatures, Operations increased steam which led to decreased NHVcz values. Supplemental gas programming and controls and Data Control System graphic alarm displays will be updated in Q3 2022. Refresher training was provided to OL-5 Operations

The GO-1 Elevated Flare experienced deviations of the Net Heating Value of Combustion Zone Gas (NHV_{cz}) limit on 2/25/2022 as determined on a Fifteen-Minute Block Average under Paragraph 55.c.

Date	# of 15-Minute Blocks	Cause & Corrective Action(s)
2/25/2022	20	The GO-1 Dry Gas Compressor (DGC) tripped on 2/25/22 due to high radial vibrations. During the flaring event, low NHVcz deviations occurred at the GO-1 Elevated Flare due to high steam flows set in manual control relative to low flare flows. The supplemental gas controls were also inadvertently set to a low BTU value, which hindered the addition of supplemental natural gas. The NHVcz control scheme was updated in March 2022 to improve compliance with the 270 BTU/scf requirement. The supplemental natural gas control setpoint was increased to ensure compliance during low flare flow scenarios.

Consent Decree Semi-Annual Report
Attachment 1 – Benzene Fenceline Monitoring

Attachment 1a: Benzene Fenceline Monitoring

Sample Period	12/21/2021	1/5/2022	1/19/2022	2/3/2022	2/17/2022	3/3/2022	3/17/2022	3/31/2022	4/14/2022	4/28/2022	5/12/2022	5/26/2022	6/9/2022	6/23/2022
	1/5/2022	1/19/2022	2/3/2022	2/17/2022	3/3/2022	3/17/2022	3/31/2022	4/14/2022	4/28/2022	5/12/2022	5/26/2022	6/9/2022	6/23/2022	7/7/2022
Average Temperaure (°F)	54.42	55.04	50.39	51.83	61.89	62.01	67.22	69.36	73.62	77.64	79.73	81.09	85.16	83.68
Average Pressure (mm Hg)	765.26	765.37	765.83	767.45	766.62	764.21	761.72	760.31	764.08	760.96	760.43	759.25	761.87	762.24
Prevailing Wind Direction	SSW	NNE	NNE	SSE	NE	NNE/SSW	SE	SE	SE	SE	SE	SE	WSW	SE
B-01	4.10	1.08	0.66	0.94	1.10	0.58	2.30	1.20	0.40	0.87	0.85	1.10	0.57	0.46
B-02	2.40	1.05	0.63	0.76	0.66	0.50	1.30	0.93	0.65	0.56	1.10	0.99	1.20	0.68
B-03	3.20	1.91	1.10	1.40	0.87	0.84	2.80	1.50	0.81	1.40	2.10	1.70	3.20	2.00
B-05	6.80	3.16	3.40	3.50	2.50	3.10	2.20	2.70	1.60	1.40	2.00	2.20	2.50	2.60
B-06	1.60	1.03	0.87	1.30	0.80	0.75	1.10	0.99	0.41	0.73	0.98	0.78	0.76	0.86
B-07	1.50	1.38	1.10	1.70	0.92	1.00	1.10	1.20	0.44	0.76	0.94	0.99	0.83	0.72
B-09	2.40	2.23	1.80	2.30	1.60	1.70	2.10	2.00	1.50	3.60	3.00	5.70	2.20	1.80
B-11	2.20	3.50	2.40	2.70	1.60	2.50	2.90	2.80	1.90	3.30	3.70	3.50	4.90	4.50
B-12	1.00	1.83	1.80	2.10	1.50	2.30	1.10	1.40	1.10	1.90	0.89	1.20	1.20	0.88
B-13	1.20	2.95	3.70	1.50	2.10	2.90	1.00	1.70	2.10	1.50	1.20	1.50	1.70	1.40
B-14	1.90	2.49	2.60	1.80	1.40	1.90	1.40	1.40	1.90	2.00	1.40	1.60	1.20	1.50
B-15	3.10	3.10	2.30	1.90	3.70	3.50	6.60	4.40	3.40	4.40	3.90	3.30	2.00	2.60
B-16	2.40	1.79	1.70	1.90	1.40	1.80	1.90	1.60	1.70	1.60	1.90	1.70	1.40	1.30
B-17	1.80	1.79	1.20	1.60	1.60	1.70	1.60	1.30	1.60	1.80	1.30	1.40	1.40	1.40
B-18	1.70	2.72	2.10	1.80	1.40	2.40	1.50	1.90	3.30	2.40	1.30	2.70	2.00	1.90
B-19	1.50	2.85	1.00	0.84	1.50	1.90	2.00	1.70	3.40	2.30	1.50	1.90	1.30	1.50
B-20	1.20	1.25	0.69	0.45	1.60	0.88	1.90	1.60	0.76	1.30	1.50	0.61	0.50	0.44
C-08	2.00	1.54	1.20	1.90	1.20	1.20	1.70	1.30	1.40	1.80	1.70	2.40	1.70	1.60
C-10	1.80	2.54	2.30	3.60	2.10	0.96	2.10	1.90	1.80	2.60	2.50	2.00	1.80	1.80
WB-01	14.00	3.53	9.50	9.30	20.00	17.00	7.70	9.30	15.00	63.00	52.00	50.00	26.00	2.80
WB-02	0.59	1.64	0.94	2.10	0.80	0.96	1.50	1.40	0.74	4.20	12.00	5.00	6.40	2.30
WB-03	1.30	1.90	2.40	8.20	3.90	2.60	2.20	1.70	2.10	2.30	4.10	6.60	2.70	0.97
WB-04	0.82	1.59	2.40	3.00	2.60	1.70	0.97	1.10	3.40	1.60	1.40	6.00	1.30	0.82
WB-05	0.67	1.50	1.70	1.80	1.60	1.20	0.75	0.80	2.30	0.97	0.87	3.00	0.81	0.65
WB-06	0.50	1.33	1.40	1.10	1.30	1.30	0.53	0.77	2.00	0.95	0.83	3.20	0.59	0.58
WB-07	0.57	1.35	0.92	1.10	1.20	0.93	0.64	0.67	1.60	0.88	0.62	1.50	0.46	0.52
WB-08	0.49	1.08	0.68	0.78	0.78	0.76	0.58	0.55	0.88	0.75	0.45	0.54	0.37	0.45
WB-09	0.57	1.24	0.69	0.86	0.74	0.74	0.57	0.63	0.86	1.10	0.60	0.59	0.39	0.49
WB-10	0.61	1.25	0.72	0.79	0.58	0.75	0.56	0.63	0.65	0.96	0.61	0.52	0.37	0.49
WB-11	1.00	1.67	1.20	1.10	0.68	0.97	0.69	1.30	1.60	2.40	1.00	0.86	0.52	0.62
WB-12	3.50	2.31	3.50	3.50	4.30	4.60	2.20	2.30	12.00	12.00	5.10	10.00	1.80	1.00
SN-BERTH-1	1.40	2.52	5.60	1.40	1.70	2.30	0.82	3.30	1.60	1.60	1.40	2.90	1.50	1.20
SN-BERTH-2	1.40	2.24	2.30	1.80	1.60	2.70	0.98	1.60	2.40	1.80	1.20	1.50	1.20	0.84
SN-BERTH-4	0.84	1.23	3.30	1.80	1.20	1.70	0.94	0.90	1.00	0.95	0.71	0.89	0.73	0.86
Minimum	0.49	1.03	0.63	0.45	0.58	0.50	0.53	0.55	0.40	0.56	0.45	0.52	0.37	0.44
Maximum	14.00	3.53	9.50	9.30	20.00	17.00	7.70	9.30	15.00	63.00	52.00	50.00	26.00	4.50
Period Delta C	13.51	2.50	8.87	8.85	19.42	16.50	7.17	8.75	14.60	62.44	51.55	49.48	25.63	4.06
Annual Rolling Average (Rolling Delta C)	13.87	13.83	14.09	13.72	14.30	14.65	14.71	11.23	11.49	13.10	14.94	15.90	16.31	16.18
Notes:	Benzene Fenceline Monitoring requirements became effective 2/6/2020. Annual rolling average delta C was not available until the period beginning on 1/14/2021.													

Summary of Root Cause Analyses and Corrective Actions for Benzene Fenceline Monitoring Program – 1H 2022 Paragraph 19 (Appendix 1.8)					
Sample Period Start	**Sample Period End**	**Period Delta C**	**Root cause(s)**	**Corrective action(s)**	**Anticipated emissions reductions (TPY)**
12/21/21	1/5/22	13.51	Between 12/19/21 and 12/28/21, elevated benzene results were detected through sour water sampling from the DU-5 Unit. During this time, DU-5 was in the process of restarting the unit following an extended shutdown and fire after Hurricane Ida resulting in crude oil getting into the sour water bypass system. The source of the benzene excursion during this period was determined to be the transfer of sour water feed from Tank XC-429 to the T-Unit. High benzene results in sour water were confirmed by the real-time benzene trailers onsite adjacent to the biotreater (T-T352) which processes sour water.	The feed going to T-unit was stopped, the level of tank XC-7005 was raised to skim oil, and the level of XC-429 and XC-7005 was raised to ensure there was enough space to surge and allow tank materials to separate to minimize the impacts at the biotreater.	N/A
2/17/22	3/3/22	19.42	Shell Chemical GO-1 unit noted a process condensate upset leading to emulsification into the sour water. This emulsification was potentially caused by the OL-5 unit pumping water in the pyrolysis gas line where GO-1 pulls re-run gasoline from OL-5. This subsequently led to water entering the GO-1 pyrofrac. An inadvertent diversion of the bypass stream into the feed stream, led to the introduction of hydrocarbon (instead of oily water mixture) to T-Unit. Sour water vessel XC-7005 continued to pump down the level of the tank during this time which led to pumping off the oil layer of XC-429. It is thought that the need to pump off the oil layer to XC-429 during this time was a result of a control loop failure in the bypass vessel. This is thought to be subsequentially caused by the atypical water quality which was being received by the sour water system at this time.	The Paraffinic Off Gas Opportunity (POGO) feed going to the OP-1 Unit was stopped, the level of XC-7005 was raised to skim oil, and the level in XC-429 was raised to make sure there was enough space to surge and allow tank materials to separate. Initiated Management of Change (MOC) to increase the size of the sour water pump impeller allowing it to be rerouted to the sour water feed system Began injection of new Emulsion Breaker into sour water to allow for greater oil/water separation. All corrective actions were complete by 4/6/2022.	Benzene: 0.002
3/3/22	3/17/22	16.50			

Summary of Root Cause Analyses and Corrective Actions for Benzene Fenceline Monitoring Program – 1H 2022 Paragraph 19 (Appendix 1.8)					
Sample Period Start	**Sample Period End**	**Period Delta C**	**Root cause(s)**	**Corrective action(s)**	**Anticipated emissions reductions (TPY)**
4/14/22	4/28/22	14.60	The most effective solution in reducing benzene concentration in the sour water sent to the Shell Chemical West Site biotreater up until June 24 was to remove the OP-1 unit's sour water from the bypass system and re-route to the sour water stripper system for treatment furnace. The benzene concentration in the resulting OP-1 sour water dropped consistently for multiple daily samples. However upon further investigation, it was discovered that an inadvertent valve lineup from OP-1 to Central Utilities was allowing the sour water stream from OP-1 to reenter the bypass stream leading to the biotreater. The inadvertent valve misalignment was corrected in the field, which produced low benzene concentrations at the West Site monitoring systems.	Paraffinic Off Gas Opportunity (POGO) was removed as a feed to the OP-1 furnace to minimize benzene concentrations in OP-1 sour water. OP-1 sour water was taken out of the Bypass Stream and placed into Sour Water Stripper Feed System. Upgrade the water source for the PGC and quench system (Q4 2022). Install DNF and benzene air strippers project to treat the sour water bypass stream (Q4 2022).	Benzene: 0.010
4/28/22	5/12/22	62.44			
5/12/22	5/26/22	51.55			
5/26/22	6/9/22	49.48			
6/9/22	6/23/22	25.63			

Consent Decree Semi-Annual Report
Attachment 2 – Summary of Reportable Flaring Incidents for OL-5 Ground and Elevated Flare System

Summary of Internal Flaring Incident Reports and Root Cause Analyses for OL-5 Ground and Elevated Flare System – 1H 2022 Paragraph 42							
RFI Start Date	**RFI End Date**	**Duration (hrs)**	**VOCs Emitted (lbs)**	**HAPs Emitted (lbs)**	**Root cause(s)**	**Corrective action(s) completed**	**Corrective action(s) outstanding**
1/1/2022 0:00	1/25/2022 9:00	585	4,870	1.0	On 8/28/2021, Shell began a safe and controlled shutdown of the Norco Manufacturing Complex in anticipation of Hurricane Ida making landfall in the area the following day. Although the elevated flare tip has been repaired, a significant amount of backburning led to high flare skin temperatures and caused flare tip integrity issues. This necessitated additional flow of natural gas, nitrogen, steam, and fuel gas for safe operation of the flare. This abnormal operational situation persisted in January 2022, leading to intermittent exceedances of the 24-hour rolling total flow.	N/A – The root cause of the incident was a major Category 4 Hurricane impacting the site, which resulted in operational changes to maintain safety.	N/A
1/26/2022 9:00	1/27/2022 12:00	27	6,082	0.14	The GO-1 Process Swing Absorber (PSA) tripped on 1/26/22, causing a swing in the site 500 lb Hydrogen header which led to a loss of hydrogen injection at OL-5 Acetylene Converters. This loss of hydrogen injection caused the AC converter outlet to go off spec on Acetylene which required flaring of the AC converter outlet until AC was back on spec.	Increased H2 input in to 500 lb H2 system to maintain higher setpoint on low clamp.	Evaluate a response control and instrumentation needed to provide moving average of PSA flow from GO1 to 500# H2 header. Planned for Q1 2023 completion.
2/3/2022 12:00	2/6/2022 1:00	61	1,015.63	1.25	On 2/3/2022, the Residual Catalyst Cracking Unit (RCCU) experienced a loss of power which caused a trip of the RCCU feed pump P-7001. The RCCU unit shutdown resulted in the inability to take BD Heavy Ends (BDHE) feed from the Shell Chemical BD-5 unit.	N/A – BDHE is a permitted vent stream to the OL-5 flare system.	N/A
2/16/2022 12:00	2/17/2022 21:00	33	535.23	1.99	On 2/16/2022, the BD-5 refrigeration compressor tripped resulting in flaring of heavy ends to the OL-5 Ground Flare. Level controller LC-0186 on the	LC-1086 and LC-0190 were repaired and returned to service.	N/A

Summary of Internal Flaring Incident Reports and Root Cause Analyses for OL-5 Ground and Elevated Flare System – 1H 2022 Paragraph 42							
RFI Start Date	**RFI End Date**	**Duration (hrs)**	**VOCs Emitted (lbs)**	**HAPs Emitted (lbs)**	**Root cause(s)**	**Corrective action(s) completed**	**Corrective action(s) outstanding**
					Waste Gas Absorber malfunctioned leading to carry over to the refrigerant exchanger. Level controller LC-1090 on the refrigerant exchanger then malfunctioned leading to the eventual compressor trip. During the same time period, the POGO system was started up. While introducing feed to the header, the system pressure exceeded the back-up PIC setpoint and relieved to the OL-5 Elevated Flare briefly.		
3/9/2022 12:00	3/10/2022 9:00	21	35.31	0.05	On 3/8/2022, OL-5 Production and support engineers performed an NHVcz control scheme test to implement control logic updates to the supplemental gas and steam controls. The test was intended to address previous NHVcz deviations experienced at the OL-5 Elevated Flare. Routine vent gas was routed away from the OL-5 Ground Flare to the OL-5 Elevated Flare during this period.	N/A – Miscellaneous maintenance and testing is a permitted vent stream to the OL-5 Flare System.	N/A
3/23/2022 19:00	3/25/2022 6:00	35	120	2.0	On 3/23/2022, a planned relief valve replacement (RV-3597) on the debutanizer overhead was executed per the preventative maintenance schedule. Following the installation, the replacement valve was found to be "leaking by" to the OL-5 Ground Flare. The valve was isolated, and the previous RV was installed in its place.	The relief valve was replaced with a rebuilt valve.	N/A
3/29/2022 16:00	4/4/2022 0:00	128	26,600.40	0.12	On 3/29/2022, Refinery Operations discovered a leak on the Rectified Absorber return line in the HCU. The unit was proactively taken offline to make necessary repairs. During the outage, H2 from OL-5 was unable to	N/A – No corrective actions required by Shell Chemical LP as the H2 flaring is permitted at the OL-5 flare system.	N/A

Summary of Internal Flaring Incident Reports and Root Cause Analyses for OL-5 Ground and Elevated Flare System – 1H 2022 Paragraph 42							
RFI Start Date	**RFI End Date**	**Duration (hrs)**	**VOCs Emitted (lbs)**	**HAPs Emitted (lbs)**	**Root cause(s)**	**Corrective action(s) completed**	**Corrective action(s) outstanding**
					be sent to HCU and was sent to the OL-5 Flare system, as permitted.		
4/4/2022 19:00	4/10/2022 6:00	131	816,264	73	On 4/4/2022, a planned swap of the MAP converter at the OL-5 unit was initiated which resulted in propylene routed to off-spec storage (PV-503) and N2 purging of PV-1788 resulting flaring at the OL-5 Flare System. On 4/6/2022 the OL-5 Deethanizer reboiler steam flow control valve positioner failed (FC5312) which resulted in upset flaring at the OL-5 Ground and Elevated flares. Additionally, on 4/7/2022 the Olefins BD-5 unit began flaring heavy ends due to a maintenance repair that was needed on the Refrigeration compressor (K-5290).	The failed valve positioner was replaced on the OL-5 Deethanizer. The flaring on 4/4 and 4/7 were the result of permitted activities.	N/A
4/11/2022 19:00	4/14/2022 2:00	55	111.82	0.14	On 4/11/2022, the OL-5 ground flare 2nd and 3rd stage steam flow meters began reading erratically at erroneously high flows. The NHV control scheme for the flare maximized supplemental gas flow to the flare in an effort to maintain adequate NHVcz values, resulting in increased routine vent gas flow to the flare.	Steam flow meters were repaired and calibrated.	N/A
4/18/2022 7:00	4/30/2022 3:00	284	4,651.81	1.84	On 4/18/2022, Refinery Operations began the controlled shutdown of the HCU for a planned maintenance outage. During the outage and subsequent startup in May 2022, H2	N/A – No corrective actions required by Shell Chemical LP as the H2 flaring is permitted at the OL-5 flare system.	N/A

Summary of Internal Flaring Incident Reports and Root Cause Analyses for OL-5 Ground and Elevated Flare System – 1H 2022 Paragraph 42							
RFI Start Date	**RFI End Date**	**Duration (hrs)**	**VOCs Emitted (lbs)**	**HAPs Emitted (lbs)**	**Root cause(s)**	**Corrective action(s) completed**	**Corrective action(s) outstanding**
5/9/2022 13:00	5/25/2022 1:00	372			from OL-5 was unable to be sent to HCU and was sent to the OL-5 Flare system, as permitted.		
6/8/2022 3:00	6/16/2022 13:00	202	1,469	4.0	On 6/8/22, the BD-5 unit began flaring due to start-up activities after a maintenance turnaround. Intermittent flaring of BD-5 vents during the startup process persisted through 6/14/22. During the BD-5 startup activities, H2 was flared from the OL-5 methanator, which also contributed to the elevated flow at the OL-5 flare system through 6/16/22.	N/A – No corrective actions required by Shell Chemical LP as the H2 and BD-5 startup flaring is permitted at the OL-5 flare system.	N/A
6/16/2022 14:00	6/22/2022 20:00	150	301	2.0	On 6/16/22, the Pressure Transmitter (PT) for the FGR compressor suction pressure controller for the FGR compressors, PC9323, started reading false and swinging above and below the suction pressure setpoint. When the false pressure intermittently dropped below the controller setpoint, the recycle valve fully opened returning the flare gas back to the flare system. This resulted in intervals of increased flows to the OL-5 Ground Flare.	PC-9332 was inspected and repaired.	LC-9332B was placed in service while LC-9332A awaits maintenance. Planned for Q4 2022

Consent Decree Semi-Annual Report
Attachment 3 – Summary of Reportable Flaring Incidents for GO-1 Elevated Flare

Summary of Internal Flaring Incident Reports and Root Cause Analyses for GO-1 Elevated Flare – 1H 2022 Paragraph 42							
RFI Start Date	**RFI End Date**	**Duration (hrs)**	**VOCs Emitted (lbs)**	**HAPs Emitted (lbs)**	**Root cause(s)**	**Corrective action(s) completed**	**Corrective action(s) outstanding**
1/1/2022 0:00	1/9/2022 19:00	211	88,722	1,791	On 12/31/2021 at 11:45 pm, the OP-1 Ethylene Refrigerant and Propylene Refrigerant Compressors shut down due to a bad card in the Bentley Nevada control scheme which resulted in an OP-1 Coldside shutdown and flaring off the 4th Stage of the Process Gas Compressor (PGC) and the OP-1 Quench Tower.	The failed Bentley card was replaced.	A low temperature alarm is to be configured on the AC converters to alert operators of the liquid entrainment to take alternative actions. Planned for Q4 2022 completion.
1/26/2022 5:00	1/27/2022 10:00	29	2,930.00	0.00	On 1/26/2022, the GO-1N Process Swing Absorber (PSA) tripped on Long Adsorption Time on Vessel 7. This led to a reduction in hydrogen flow, causing the AC Converter outlet to go off spec on Acetylene leading to flaring off the AC Converter outlet until AC was back on spec.	Increased H2 input to maintain higher setpoint.	Evaluate process control improvements on the H2 system for faster response. Planned for Q4 2022.
2/3/2022 19:00	2/4/2022 22:00	27	3,077	1.8	On 2/3/2022, the Residual Catalyst Cracking Unit (RCCU) experienced a loss of power which caused a trip of the RCCU feed pump P-7001. The upset conditions at RCCU caused the RCCU dry gas, which is taken by the GO-1 operating unit as feed, to go off spec and necessitated GO-1 to flare the dry gas feed until sample results were received and within specification parameters.	N/A – The flaring of off spec third party dry gas is a permitted vent stream within Olefins Title V Air Permit 2520-V10.	N/A

Summary of Internal Flaring Incident Reports and Root Cause Analyses for GO-1 Elevated Flare – 1H 2022 Paragraph 42							
RFI Start Date	**RFI End Date**	**Duration (hrs)**	**VOCs Emitted (lbs)**	**HAPs Emitted (lbs)**	**Root cause(s)**	**Corrective action(s) completed**	**Corrective action(s) outstanding**
2/25/2022 5:00	2/26/2022 13:00	32	5,986	130	For all the trip events, the flaring was caused by the GO-1N Dry Gas Compressor tripping on high radial vibration. This high vibration was caused by liquid to the compressor and mechanical rub. The liquid condensed out of the vapor stage due to operating at lower than normal temperatures. When the liquid condensed, it likely quickly filled the suction boots and was carried over into the compressor, "slugging" it and creating high vibration. The lower temperatures are a result of both process and weather conditions (2nd stage temperatures saw a step change of 10-20 deg F lower following startup from Hurricane Ida, and the first two trips corresponded with rain events). There was some insulation removed in the system in the last few years which could lead to slightly more heat loss to the environment but we do not think this alone is causal to liquid hitting the compressor during cooler weather.	Suction drum scan completed; Turned off one fin fan on the interstage on the interstage fin fan coolers (E-1929, E-1930, E-1931); Coolers on the lube oil skids were backflushed; Temperature control valve was manually actuated; Equipment electrical grounding was inspected and tested; Implementation of a standardized operator round to drain liquid in manual drains; A Management of Change (MOC) to increase oil viscosity was executed and alarms have been implemented to detect signs of instability	Bearings will be inspected during the next planned DGC outage.
3/22/2022 19:00	3/24/2022 0:00	29					
4/8/2022 7:00	4/9/2022 6:00	23					
4/25/2022 23:00	5/1/2022 9:00	130					
5/3/2022 13:00	5/4/2022 21:00	32	5,584	0	On 5/3/2022, RCCU began sending RCCU Dry Gas to GO-1N as part of the RCCU Startup. This Dry Gas was flared from PC901 at the GO-1N DEA Treater inlet while waiting on an on-spec sample before feeding forward to the treaters and on to the Dry Gas Compressor. A momentary loss of H2 flow at the AC Converters while getting off of the H2 flow control valve bypass and back onto the flow control valve led to going off spec on Acetylene at the AC	RCCU SU flaring is permitted in 2520-V10, however Operations training was provided on the H2 valve.	N/A

Summary of Internal Flaring Incident Reports and Root Cause Analyses for GO-1 Elevated Flare – 1H 2022 Paragraph 42							
RFI Start Date	**RFI End Date**	**Duration (hrs)**	**VOCs Emitted (lbs)**	**HAPs Emitted (lbs)**	**Root cause(s)**	**Corrective action(s) completed**	**Corrective action(s) outstanding**
					Converter outlet. This led to flaring from PC9173 AC Outlet to Flare.		
6/12/2022 16:00	6/14/2022 14:00	46	2,551	0	On 6/12/2022, the GO-1N Dry Gas Compressor (DGC) had a spurious trip due to a failed Moore Site Programmable Alarm (SPA) (aka Moore controller) leading to flaring of treated Dry Gas. The Moore controller experienced a failure leading to signal loss of level transmitter, LI3681, which engaged the shutdown of the DGC.	The SPA controller and level transmitter were replaced.	N/A

Consent Decree Semi-Annual Report
Attachment 4 – Summary of Reportable Flaring Incidents for West Ops Elevated Flare

Summary of Internal Flaring Incident Reports and Root Cause Analyses for West Ops Elevated Flare – 1H 2022 Paragraph 42							
RFI Start Date	**RFI End Date**	**Duration (hrs)**	**VOCs Emitted (lbs)**	**HAPs Emitted (lbs)**	**Root cause(s)**	**Corrective action(s) completed**	**Corrective action(s) outstanding**
-	-	-	-	-	N/A – No Reportable Flaring Incidents in 1st Half of 2022.	N/A	N/A

Consent Decree Semi-Annual Report
Attachment 5 – April 2022 Hurricane Ida Force Majeure Notification

CERTIFIED MAIL #7011 1150 0000 0146 9888
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Office of Civil Enforcement
U.S. Environmental Protection Agency
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1200 Pennsylvania Avenue, N.W.
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Celena Cage
Enforcement Administrator
Office of Environmental Compliance
Louisiana Department of Environmental Quality
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Baton Rouge, LA 70821-4312

CERTIFIED MAIL #7011 1150 0000 0146 9901
Dwana C. King
Deputy General Counsel
Legal Division
Louisiana Department of Environmental Quality
P.O. Box 4302
Baton Rouge, LA 70821-4302

April 28, 2021

SUBJECT: UNITED STATES V. SHELL CHEMICAL LP
CIVIL ACTION NUMBER 2:18-cv-1404-EEF-JVM
RE: COVID-19 Related Force Majeure Notification in United States of America et al. v. Shell Chemical LP, 2:18-cv-1404 (E.D. La.)
(DJ No. 90-5-2-1-11603)
LDEQ AI NO. 26336

Dear Sir or Madam:

This submittal is intended to provide follow-up and final notification for the Force Majeure event that caused delay of an obligation pursuant to the provisions of paragraph 95 of Civil Action Number 2:18-cv-1404-EEF-JVM (Consent Decree) at Shell Chemical LP – Norco Manufacturing Complex (Shell).

The OL-5 Elevated Flare was required to comply with Paragraphs 22 through 24 and 26 through 30 by March 31, 2021. The OL-5 Elevated Flare compliance with those referenced Paragraphs was achieved on April 27, 2021. The following sections outline the previous submittals, the final compliance schedule, and information around the delays for the Force Majeure event. Note that the Force Majeure event did not affect compliance for the three other Affected Flares.

Previous Communications and Submittals

An e-mail notification was made on March 27, 2020 to the United States Environmental Protection Agency (USEPA) and Louisiana Department of Environmental Quality (LDEQ), and a written report was being submitted on April 2, 2020 to satisfy the notification requirements in Paragraph 95.

At the time of that submittal, Shell anticipated a three to four-month delay in the turnaround schedule (which is required for OL-5 Elevated Flare instrumentation installation), and the information regarding the reasons for delay have remained true since submittal. Notably, Shell anticipated significant impacts to the turnaround planning cycle for the OL-5 Unit and based on the nature of the COVID-19 pandemic, Shell projected critical vendor delays and staffing challenges. Shell received a response to this submittal from the USDOJ on April 21, 2020. For reference, the April 2, 2020 submittal is included at Attachment 1 and the April 21, 2020 respond is included in Attachment 2.

On February 24, 2021, Shell had a virtual meeting with USEPA and USDOJ to provide updated scheduling regarding the compliance of OL-5 Elevated Flare instrumentation installation. At this time, Shell discussed the continued delays due to the COVID-19 pandemic and provided the most up to date schedule at that time with expected monitor installation.

Compliance Update

The anticipated delays discussed in oral communications and the written report were realized, and the OL-5 Unit turnaround began on March 31, 2021. The installation of the monitoring equipment required in Paragraphs 22 through 24 and 26 through 30 for the OL-5 Elevated Flare was completed on April 27, 2020. It should be noted that the OL-5 Unit is not yet operational (i.e., no waste gas is being produced or flared) and is expected to be back online after the rest of the turnaround scope is completed in mid to late May.

Summary

Shell continues to assert that the delay of the compliance obligations for the OL-5 Elevated Flare instrumentation installation (Paragraphs 22-24, 26-30) were a result of a Force Majeure Event, as noted in prior communications, and Shell made best efforts to minimize the impacts of the delay. The notification requirements in Paragraph 95 of the Consent Decree were met with the April 2, 2020 submittal are included in the attachment for reference.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If you have any questions, please call Pierre Espejo at 832-337-4611 or pierre.espejo@shell.com.

Sincerely,

Tammy Little
General Manager – Norco Manufacturing Complex
Attorney-in-Fact – Shell Chemical LP

LJS/mlc

Enclosures

cc: W/Attachments

EES Case Management Unit
Environment and Natural Resources Division
U.S. Department of Justice
P.O. Box 7611
Washington, D.C. 20044-7611
Re: DJ #90-5-2-1-11603

United States Attorney for the Eastern District of Louisiana
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